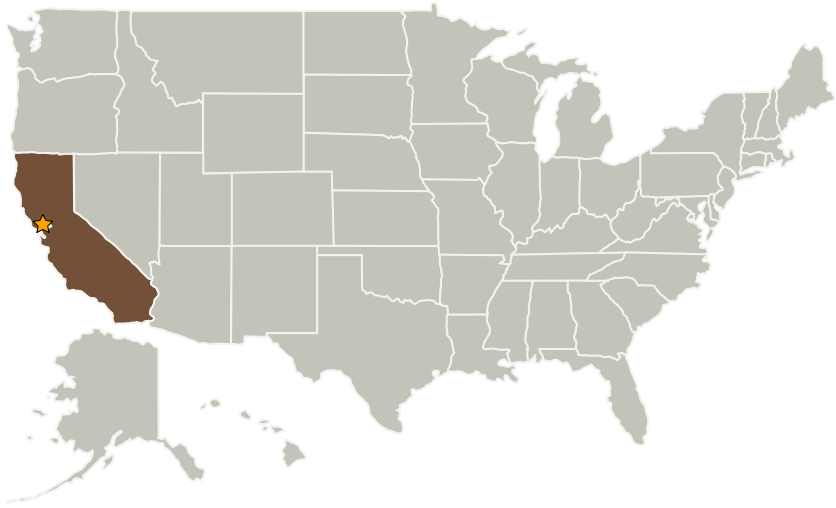
Multi-Agent Prognostics Health and Usage Monitoring (Multi-PHUM), Phase II

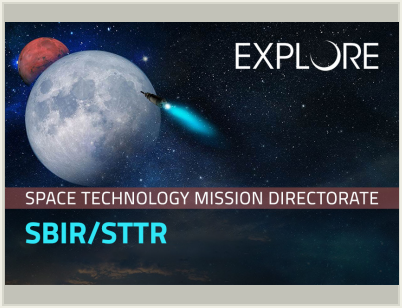
Completed Technology Project (2005 - 2007)

Project Introduction

The goal of Phase I study was to investigate advanced pattern recognition techniques for use in fault diagnosis. Three individual experts have been developed based on Auto Associative Neural Networks (E-AANN), Kohonen Self Organizing Maps (KSOM), and the Radial Basis Function based Clustering (RBFC) algorithms. We have used a Matlab Simulink model of a Chiller system to test our algorithms. The set of individual experts are later managed by a Gated Expert algorithm which assigns the experts based on their best performance regions. In Phase II, we propose to implement our results on two dynamic systems. The first is a Chiller system at the Texas A&M University. The second is an engine under study in Pratt and Whitney under a contract to Professor George Vactsevanos from Georgia Tech. The end deliverable of Phase II will be a complete dynamic Case Based Reasoning (GED-CBR) system managed by a Gated Experts algorithm all coded in Matlab. GED-CBR will be highly applicable to dynamic systems that can benefit from the power of Dynamic Case Based Reasoning managed by a powerful Gated Experts architecture. It is expected that GED-CBR will find applications in prognostics of the nuclear reactor on board the JIMO spacecraft.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Multi-Agent Prognostics Health and Usage Monitoring (Multi-PHUM), Phase II

Completed Technology Project (2005 - 2007)

Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Intelligent Inference Systems Corp	Supporting Organization	Industry	Moffett Field, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.7 Innovative RF Technologies